Imaging polarimetry of comets 32P/Comas Sola and C/2015 V2 (Johnson)

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We present polarimetric observations of comets 32P/Comas Sola and C/2015 V2 (Johnson) performed on February 20, 2015 (post-perihelion) and December 30, 2016 (pre-perihelion) at low phase angles which were carried out using the 1.04-m Sampurnanand telescope of the Aryabhatta Research Institute of Observational Sciences (ARIES), Nainital, India. The degree of linear polarization was −1.54% for 32P/Comas Sola and −1.95% for C/2015 V2 (Johnson) at their respective photocenters. Radial dependence of polarization as well as intensity obtained from polarization and intensity profiles suggests the variation of physical properties of dust grains and the dust distribution in the cometary comae. Study of negative polarization at a lower phase angle reveals the composition feature of the cometary nucleus which holds great importance in cometary science. Our polarimetric results match well the Rosetta mission's results which infer about the heterogeneity of cometary dust. A detailed study of the polarimetric properties of comets is also made in this work.

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